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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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EXAMINER

TRAN, TAN N

ART UNIT PAPER NUMBER

2826

DATE MAILED: 05/29/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/007,833

Applicant(s)

AVERY ET AL.

Examiner

TAN N TRAN

Art Unit

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133)
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on amendment filed on 03/19/03.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-31 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 24-31 is/are allowed.
- 6) ☒ Claim(s) 1-3, 5-8, 11, 15, 16, 18-20 is/are rejected.
- 7) ☒ Claim(s) 4, 9, 10, 12-14, 17 and 21-23 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____
- 4) ☐ Interview Summary (PTO-413) Paper No(s) _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other:

DETAILED ACTION

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless -

(e) the invention was described in a patent granted on an application for patent by another filed in the United States before the invention thereof by the applicant for patent, or on an international application by another who has fulfilled the requirements of paragraphs (1), (2), and (4) of section 371(c) of this title before the invention thereof by the applicant for patent.

Claims 1,2 stand rejected under 35 U.S.C. 102(e) as being anticipated by Russ (2002/0041007) as reasons set forth in the Office Action paper no. 5.

With regard to claim 1, Russ discloses an electrostatic discharge protection circuit comprising a silicon controlled rectifier 102(202) having an anode 122(222) coupled to the protected circuitry and a cathode 124(224) coupled to ground, the N+ cathode 124(224) having at least one first high doped region; at least one trigger-tap 322(320), disposed proximate to the at least one high-doped region and an external triggering device 205(207) coupled to the trigger-tap 322(320) and protected circuitry through the SCR (202₁ and 202₂). (Note lines 2,3, paragraph 0005, page 1; lines 1,2, paragraph 0028, page 3; lines 14-16, paragraph 0035, and lines 4-6, paragraph 0036, page 4 figs. 2-5 of Russ). The trigger device 207 can be a PMOS (lines 4-6 in left column on page 5 of Russ).

With regard to claim 2, Russ discloses a lateral shunt resistor R_{p1} coupled between the cathode 124 and the external triggering device 205. (Note figs. 2-5 of Russ).

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 3,5-8,11,15,16,18-20 stand rejected under 35 U.S.C. 103(a) as being unpatentable over Russ (2002/0041007) as set forth in the Office Action paper no.5.

With regard to claim 15, Russ discloses a SCR comprising a substrate 302; a N-well 308₁ and an adjacent P-well 306₁ formed in the substrate 302 and defining a junction therebetween; at least on N + doped region 310₁₋₁ in the p-well 306₁ and coupled to ground 330_c; a P+ doped region 312₁₋₁ in the N-well 308₁ and coupled to a pad 132 of the protected circuitry; at least one p+ doped trigger-tap 322 disposed proximate to the at least one N+doped region in the P-well 306₁ and an external triggering device 205(207) coupled to the SCR wherein one terminal is coupled to the trigger tap 322(320). (Note lines 2,3, paragraph 0005, page 1; lines 1,2, paragraph 0028, page 3; lines 14-16, paragraph 0035, and lines 4-6, paragraph 0036, page 4 figs. 2-5 of Russ). Russ discloses all the claimed subject matter except another terminal of the triggering device 205(207) is connected to the pad. However, it would have been obvious to one of ordinary skill in the art to form another terminal of the triggering device is connected to the pad

in order to turn on the SCR so that the circuitry can be protected from ESD. Note Note figs. 1A, 1B of Applicant's prior art is cited to support for the well know position.

With regard to claim 16, Russ discloses the terminal of the triggering device having trigger gate 105 is coupled to ground 124 via a resistor Rp1. (Note fig. 1 of Russ).

With regard to claim 19, Russ discloses a P-well-tie 322₁ is coupled to the Pwell and grounded. (Note figs. 2 and 5 of Russ).

With regard to claims 3,7,11 Russ discloses the SCR comprises a first bipolar transistor (QN1) and a second bipolar transistor (QN2); the first bipolar transistor (QN1) having the at least one first high doped region 310₁₋₁ serving as an emitter and forming the cathode, a first low doped region 306₁ coextensively forming a base of the first bipolar transistor (QN1) and a collector of the second bipolar transistor (QN2), a second low doped region 308₁ coextensively forming a base of the second bipolar transistor (QN2) and a collector of the first bipolar transistor (QN1), and a second high doped region 312₁₋₁ serving as an emitter of the second bipolar transistor (QN2) and forming the anode. (Note fig. 4 of Russ).

With regard to claims 5,6,18, Russ disclose all claimed invention as in claim 3, except the bases of the first and second transistors have base widths in a range of 0.6 to 0.8 or less than 4.0 microns. However, although Russ does not teach exact the base width range of transistor as that claimed by Applicant, the base width range differences are considered obvious design choices and are not patentable unless unobvious or expected results are obtained from these changes. It appears that these changes produce no functional differences and therefore would have been obvious. Note in re Leshin, 125 USPQ 416.

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With regard to claims 8,20, Russ discloses all the claimed subject matter except for the triggering device is an NMOS FET. However, it would have been obvious to one of ordinary skill in the art to form the triggering device of Russ is NMOS FET, because NMOS and PMOS can be interchanged.

Allowable Subject Matter

3. Claims 24-31 are allowable over the prior art of record because none of these references disclose or can be combined to yield the claimed invention such as a PMOS transistor trigger device coupled to the SCR, wherein the drain is coupled to ground and the source is coupled to the trigger tap; the source is coupled to the pad via a shunt resistor; and the pad is further coupled to the protected circuitry as recited in claim 24.

4. Claims 4, 9,10,12-14,17,21-23 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Claims 4, 9,10,12-14,17,21-23 are allowable over the prior art of record because none of these references disclose or can be combined to yield the claimed invention such as a surface area between the respective first and second high-doped regions of the first and second bipolar transistors are blocked from shallow isolation as recited in claims 4,14,17,23, a source and drain of the MOSFET transistor are respectively coupled to the trigger-tap and to the protected circuitry as recited in claims 9,12,21.

Response to Arguments

5. Applicant's arguments filed 3/19/03 have been fully considered but they are not persuasive.

It is argued, at pages 11 and 13 of the remark, that "Nowhere is there any teaching, or even suggestion, of "an external on-chip tripggering device coupled to the trigger-tap of the protected circuitry", and "nowhere in the Russ reference is there any teaching that the trigger device itself is external to the SCR." However, figs. 2-5 of Russ do show and a triggering device 205(207) coupled to the trigger-tap 322(320) and protected circuitry through the SCR (202₁ and 202₂) and triggering device 205,207 is external to the SCR (202₁ and 202₂). Thus, Applicant's claims 1,15 do not distinguish over Russ reference.

Conclusion

6. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be

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calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

7. Any inquiry concerning this communication or earlier communication from the examiner should be directed to Tan Tran whose telephone number is (703) 305-3362. The examiner can normally be reached on M-F 8:30AM-5PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nathan Flynn can be reached on (703) 308-6601. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 308-7722 for regular communications and (703) 308-7724 for after final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0956.

TT

May 2003

Minhloan Tran
Minhloan Tran
Primary Examiner
Art Unit 2826